

LISTING OF THE CLAIMS:

1. (Currently Amended) A method for electrically stressing through a specified voltage at least one semiconductor chip on a wafer for controlled contactless burn-in, voltage screen and reliability evaluation of product wafers, said method comprising:

applying said voltage to said at least one chip for the probing thereof in the absence of physically contacting the chip surface; and

interposing a mask comprising a metallic wiring line layer forming a wire loop on said wafer for magnetically inducing said voltage from ends of the wire loop providing electrical connections to said at least one chip, said mask having the voltage induced thereto when placed in a magnetic field and thereafter conducted to electrical contacts on said wafer.

2. (Previously Amended) A method as claimed in Claim 1, wherein said magnetically induced voltage is produced utilizing a time varying magnetic field.

3. (Previously Amended) A method as claimed in Claim 2, wherein an electrical field which is represented by said induced voltage is based on Faraday's law setting forth that said voltage which is induced by a time rate of change of a magnetic field which is fixed with respect to said magnetic field.

4. (Previously Amended) A method as claimed in Claim 1, wherein said mask is positioned on said wafer; and connections are made to said at least one chip by said mask for effectuating said burn-in without interference with the normal operation of said at least one semiconductor chip.

5. (Currently Amended) A method as claimed in Claim 2, wherein a loop is provided defining an area on said wafer, said mask being positioned on said wafer so as to enclose said area and having electrical contacts formed by said wire loop ends connecting to said at least one chip for an induced voltage through said time varying magnetic field within said enclosed area.

6. (Currently Amended) A method as claimed in Claim 5, wherein said loop comprises a metallic line wire loop on said wafer forming an open circuit having electrical contact points provided at open ends of said wire loop of said circuit for producing said induced voltage.

7. (Original) A method as claimed in Claim 6, wherein said loop is of a rectangular configuration to define a generally rectangular area on said wafer.

8. (Original) A method as claimed in Claim 6, wherein said metallic line is constituted of copper.

9. (Original) A method as claimed in Claim 6, wherein said metallic line is constituted of aluminum.

10. (Previously Amended) A method as claimed in Claim 2, wherein said magnetic field is produced by a magnetic system which comprises a circular magnetic core having an air gap for receiving said wafer with said at least one chip and said mask positioned thereon; and a voltage source connected to an electrical coil for energizing said magnetic core to produce said induced voltage.

11. (Previously Amended) A method as claimed in Claim 10, wherein said said magnetic core is energized through a radio frequency voltage source.

12. (Original) A method as claimed in Claim 11, wherein said circular magnetic core is constituted of a Permalloy powder having a composition 2% by weight of *Mo*, 81% by weight of *Ni* with the remainder being iron and impurities.

13. (Original) A method as claimed in Claim 10, wherein said air gap receiving said wafer and mask is adapted to provide for the burn-in of differently sized wafers.

14. (Original) A method as claimed in Claim 10, wherein said electrical energizing coil consists of an isolated electrical wire comprised of copper wire strands.

15. (Original) A method as claimed in Claim 10, wherein said wafer and mask are retained in said air gap by a wafer holder consisting of a dielectric material.

16. (Original) A method as claimed in Claim 10, wherein said magnetic core includes a plurality of said circular magnetic cores interconnected by arms, and each said core having an air gap for receiving respectively a wafer and covering mask so as to facilitate the simultaneous controlled burn-in of a plurality of said wafers.

17. (Withdrawn) A method as claimed in Claim 2, wherein a rectangular core of non-magnetic material has electrical wire coils wound thereabout, said wire coils being connected to decal masks on a plurality of wafers positioned centrally on said core, each said decal mask being provided to conduct a generated voltage to a chip under said mask.

18. (Withdrawn) A method as claimed in Claim 17, wherein each said coil is conducted to a time varying voltage source so as to generate a magnetic field perpendicular to the surface of each said wafer in the center of said non-magnetic core.

19. (Withdrawn) A method as claimed in Clam 18, wherein electrical wires extend from each said mask to a panel for the direct measurements and verification of the direct voltages present on each of said wafer.

20. (Withdrawn) A method as claimed in Claim 17, wherein said non-magnetic core is constituted of wood.

21. (Withdrawn) A method as claimed in Claim 17, wherein at least nine wafers are positioned on each core for simultaneous burn-in thereof.

22. (Original) A method as claimed in Claim 1, wherein said mask comprises an interposer forming a decal on said wafer surface so as to protect the surface of said wafer from direct contact with a probe during burn-in and voltage screening through electrical stressing.

23. (Original) A method as claimed in Claim 22, wherein said method conducts the generated burn-in voltage to said at least one chip when mountable on P+ silicon substrates.

24. (Original) A method as claimed in Claim 22, wherein said method conducts the generated burn-in voltage to said at least one chip when mountable on P- silicon substrates.

25. (Original) A method as claimed in Claim 22, wherein said interposer is formed for mounting the wafer on either P+ silicon or P- silicon substrates by the steps of:

fixing a polyimide film to a frame to fully cover said wafer;

depositing at least one layer of a metallic film onto the polyimide film;

patterning said metallic film to provide wiring lines extending to the edge of said wafer to facilitate measuring the induced voltage;

removing exposed metallic layer material at the bottom of the vias and
depositing a further wiring line layer forming a ring wire loop on said wafer
which is connected to said first wiring lines to facilitate applying an electrical bias to
each said ring wire loop;

placing lead/tin bumps into each of said vias and connecting said bumps to said
further wiring lines; and

adjusting bump heights whereby the pattern of the bumps interiorly of the decal
mask is a mirror-image of wire bond pads or C4 connects on the wafer chip which is to
be burned-in.

26. (Currently Amended) A system for electrically stressing through a specified
voltage at least one semiconductor chip on a wafer for controlled contactless burn-in,
voltage screen and

reliability evaluation of product wafers, said system comprising:
a circuit for applying said voltage to said at least one chip for the probing thereof
in the absence of physically contacting the chip surface; and

a mask comprising a metallic wiring line layer forming a wire loop being
arranged on said wafer through which said voltage is magnetically induced and applied to
said at least one chip from ends of said wire loop providing electrical connections
through the interposition of said mask onto which the voltage is induced when placed in a
magnetic field and thereafter conducted to electrical contacts on said wafer.

27. (Previously Amended) A system as claimed in Claim 26, wherein said induced voltage is produced by utilizing a time varying magnetic field.

28. (Previously Amended) A system as claimed in Claim 27, wherein an electrical field which is represented by said induced voltage is based on Faraday's law setting forth that said voltage which is induced by a time rate of change of a magnetic field which is fixed with respect to said magnetic field.

29. (Original) A system as claimed in Claim 26, wherein said induced voltage is obtained at a top layer of said mask which is positioned on said wafer; and connections are made to said at least one chip by said mask for effectuating said burn-in without interference with the normal operation of said at least one semiconductor chip.

30. (Currently Amended) A system as claimed in Claim 27, wherein there is provided a loop defining an area on a wafer, said mask being positioned on said wafer so as to enclose said area; and a loop having electrical contacts formed by said wire loop ends contacting said at least one chip for an induced voltage through said time varying magnetic field being provided within said enclosed area.

31. (Currently Amended) A system as claimed in Claim 30, wherein said loop comprises a metallic line wire loop on said wafer forming an open circuit having electrical contact points provided at open ends of said wire loop of said circuit for producing said induced voltage.

32. (Original) A system as claimed in Claim 31, wherein said loop is of a rectangular configuration to define a generally rectangular area on said wafer.

33. (Original) A system as claimed in Claim 31, wherein said metallic line is constituted of copper.

34. (Original) A system as claimed in Claim 31, wherein said metallic line is constituted of aluminum.

35. (Previously Amended) A system as claimed in Claim 28, wherein said magnetic field is produced by a magnetic system which comprises a circular magnetic core having an air gap for receiving said wafer with said at least one chip and said mask positioned thereon; and an electrical coil for energizing said magnetic core to produce said induced voltage.

36. (Previously Amended) A system as claimed in Claim 35, wherein said electrical core is energized through a radio frequency voltage source.

37. (Original) A system as claimed in Claim 36, wherein said circular magnetic core is constituted of a Permalloy powder having a composition 2% by weight of *Mo*, 81% by weight of *Ni* with the remainder being iron and impurities.

38. (Original) A system as claimed in Claim 35, wherein said air gap receiving said wafer and mask is adapted to provide for the burn-in of differently sized wafers.

39. (Original) A system as claimed in Claim 35, wherein said electrical energizing coil consists of an isolated electrical wire comprised of copper wire strands.

40. (Original) A system as claimed in Claim 35, wherein said wafer and mask are retained in said air gap by a wafer holder consisting of a dielectric material.

41. (Original) A system as claimed in Claim 35, wherein said magnetic core includes a plurality of said circular magnetic cores interconnected by arms, and each said core having an air gap for receiving respectively a wafer and covering mask so as to facilitate the simultaneous controlled burn-in of a plurality of said wafers.

42. (Withdrawn) A system as claimed in Claim 27, wherein a rectangular core of non-magnetic material has electrical wire coils wound thereabout, said wire coils being connected to decal masks on a plurality of wafers positioned centrally on said core, each said decal mask being provided to conduct a generated voltage to a chip under said mask.

43. (Withdrawn) A system as claimed in Claim 42, wherein each said coil is conducted to a time varying voltage source so as to generate a magnetic field perpendicular to the surface of each said wafer in the center of said non-magnetic core.

44. (Withdrawn) A system as claimed in Claim 43, wherein electrical wires extend from each said mask to a panel for the direct measurements and verification of the direct voltages present on each of said wafer.

45. (Withdrawn) A system as claimed in Claim 42, wherein said non-magnetic core is constituted of wood.

46. (Withdrawn) A system as claimed in Claim 42, wherein at least nine wafers are positioned on each core for simultaneous burn-in thereof.

47. (Original) A system as claimed in Claim 26, wherein said mask comprises an interposer forming a decal on said wafer surface so as to protect the surface of said wafer from direct contact with a probe during burn-in and voltage screening through electrical stressing.

48. (Original) A system as claimed in Claim 47, wherein said method conducts the generated burn-in voltage to said at least one chip when mountable on P+ silicon substrates.

49. (Original) A system as claimed in Claim 47, wherein said method conducts the generated burn-in voltage to said at least one chip when mountable on P- silicon substrates.

50. (Original) A system as claimed in Claim 47, wherein said interposer is formed for mounting the wafer on either P+ silicon or P- silicon substrates by means of:

- fixing a polyimide film to a frame to fully cover said wafer;
- depositing at least one layer of a metallic film onto the polyimide film;
- patterning said metallic film to provide wiring lines extending to the edge of said wafer to facilitate measuring the induced voltage;
- removing exposed metallic layer material at the bottom of the vias and depositing a further wiring line layer forming a ring wire loop on said wafer which is connected to said first wiring lines to facilitate applying an electrical bias to each said ring wire loop;
- placing lead/tin bumps into each of said vias and connecting said bumps to said further wiring lines; and
- adjusting bump heights whereby the pattern of the bumps interiorly of the decal mask is a mirror-image of wire bond pads or C4 connects on the wafer chip which is to be burned-in.

IN THE DRAWINGS:

Annotated sheets containing new Figures 3b and 3c and amended Figure 6 are herewith submitted.

Applicants have amended the drawings, as attached hereto, wherein applicants have submitted new Figures 3b and 3c indicating, respectively, on enlarged scales the chip of Figure 1, as arranged on Figure 3a; and the wafer 24 of Figure 3a shown on a further enlarged scale in new proposed Figure 3b, which discloses the components of Figures 1 and 3a on a further enlarged scale.

The foregoing proposed drawing changes do not in any manner introduce new subject matter, in that the mask, as set forth in Claims 1 and 26, is clearly illustrated in the enlarged versions of Figures 3b and 3c. In this connection, as also introduced into the amended claims, the mask represents a metallic wiring line layer, forming a wire loop 16, as shown in Figures 1 and 2.

Furthermore, an appropriate amendment has been implemented to Figure 6 indicating, at the bottom of the figure, that reference numeral “62” should read as “66”, as shown in the annotated sheet. Upon the Examiner’s approval of the drawing amendment, applicants will submit appropriate formal replacement sheets.